1. In a machine vision method of thresholding an image ("first image"), the improvement comprising the step of

for each of at least selected neighborhoods of plural pixels in the first image ("first image pixels"):

generating a value ("defocused value") that is a statistical function of values of the plural pixels in that neighborhood,

comparing that defocused value with one or more first thresholds and generating, based on that comparison, a result ("first neighborhood threshold result") for that neighborhood, wherein the one or more first thresholds are held constant for all neighborhoods,

comparing that defocused value with one or more second thresholds and generating, based on that comparison, a result ("second neighborhood threshold result") for that neighborhood, and wherein the one or more second thresholds vary in accord with a region of the image in which that neighborhood is located.

2. In a machine vision method according to claim 1, the further improvement wherein the generating step includes generating each defocused value as an average of the values of the plural pixels in the respective neighborhood.

3. In a machine vision method according to claim 1, the further improvement comprising generating an image ("threshold image") comprising any of the first and second neighborhood threshold results.

4. In a machine vision method according to claim 1, the further improvement comprising positioning any of the first and second neighborhood threshold results in the threshold image based on a position of the corresponding neighborhoods in the first image.

5. In a machine vision method according to claim 1, the further improvement wherein the step of generating the defocused value includes maintaining running averages of columns of pixels from the first image.

6. In a machine vision method according to claim 1, the further improvement wherein sizes and shapes of the neighborhoods vary along the image.

7. In a machine vision method according to claim 1, the further improvement wherein the defocused values are generated using a filter that includes

a down delay memory that holds each first image pixel value entering the filter ("new pixel value") for a specified period before outputting it,

a down accumulator having J storage elements, where J is a number of columns in the first image, each element maintaining a sum of N rows of pixel values for a corresponding column of the first image,

down accumulator logic, coupled with the down delay memory and with the down accumulator, the down accumulator logic adding each new pixel value to a sum maintained by the down accumulator for the column with which the new pixel value is associated, subtracting therefrom a pixel value output by the down delay memory, and storing a result ("new down-sum") back into the down accumulator,

a cross delay memory, coupled with the down accumulator logic, that holds each new down-sum for a specified period before outputting it,

a cross accumulator that maintains a sum of a current M-column by N-row rectangular neighborhood,

cross accumulator logic, coupled with the cross delay memory and with the cross accumulator, that adds each newly calculated down-sum to a sum maintained in the cross accumulator, subtracts therefrom a down-sum output

by the cross delay memory, and stores a result ("new cross-sum") back to the cross accumulator.

8. In a machine vision method of thresholding an image ("first image"), the improvement comprising the step of

for each of at least selected groups of plural pixels in the first image ("first image pixels"):

generating a value ("defocused value") that is a statistical function of values of the plural pixels in that group,

comparing that defocused value with one or more thresholds and generating, based on that comparison, a result ("group threshold result") for that group.

9. In a machine vision method according to claim 8, the improvement wherein the one or more thresholds are held constant for all groups of first image pixels.

10. In a machine vision method according to claim 8, the improvement wherein the one or more thresholds used with at least one group of first image pixels varies from the one or more thresholds used with at least one other group of first image pixels.

11. In a machine vision method according to 10, the further improvement wherein the one or more thresholds are a function of values of plural pixels in a region that includes a plurality of groups of first image pixels.

12. In a machine vision method according to claim 8, the further improvement comprising generating an image ("threshold image") comprising the group threshold results for a plurality of groups of the first image.

13. In a machine vision method according to claim 12, the further improvement comprising positioning the group threshold results in the threshold image based on a position of the corresponding groups in the first image.

14. In a machine vision method according to claim 8, the further improvement wherein the step of generating the defocused value includes maintaining running averages of columns of pixels from the first image.

15. In a machine vision method according to claim 8, the further improvement wherein each of the selected groups comprise neighboring pixels.

16. In a machine vision method according to claim 8, the further improvement wherein the generating step includes generating the defocused value as an average of the values of the plural pixels in the respective group.

17. In a machine vision system of the type that thresholds an image "first image"), the improvement comprising a filter used to calculate an average pixel value of an M-column by N-row neighborhood within the first image, the filter including

a down delay memory that holds each first image pixel value entering the filter ("new pixel value") for a specified period before outputting it,

a down accumulator having J storage elements, where J is a number of columns in the first image, each element maintaining a sum of N rows of pixel values for a corresponding column of the first image,

down accumulator logic, coupled with the down delay memory and with the down accumulator, the down accumulator logic adding each new pixel value to a sum maintained by the down accumulator for the column with which the new pixel value is associated, subtracting therefrom a pixel value output by the down delay memory, and storing a result ("new down-sum") back into the down accumulator,

a cross delay memory, coupled with the down accumulator logic, that holds each new down-sum for a specified period before outputting it,

a cross accumulator that maintains a sum of a current M-column by N-row rectangular neighborhood,

cross accumulator logic, coupled with the cross delay memory and with the cross accumulator, that adds each newly calculated down-sum to a sum maintained in the cross accumulator, subtracts therefrom a down-sum output by the cross delay memory, and stores a result ("new cross-sum") back to the cross accumulator.

18. In a machine vision system according to claim 17, the further improvement comprising a divider, coupled with the cross accumulator logic, that divides each new cross-sum by a product of M * N.

20. In a machine vision system according to claim 17, the improvement comprising level thresholding that compares the new cross-sum with one or more first thresholds and generates, based on that comparison, a result ("first neighborhood threshold results") for that neighborhood, where the one or more first thresholds are constant for all neighborhoods.

21. In a machine vision system according to claim 20, the improvement comprising base line threshold logic that compares the new cross-sum with one or more second thresholds and generates, based on that comparison, a result ("second neighborhood threshold result") for that neighborhood, where the one or more second thresholds vary in accord with a region of the image in which the respective neighborhood is located.

22. In a machine vision system according to claim 21, the further improvement comprising logic that generates an output image ("threshold image") comprising any of the first and second neighborhood threshold results.

23. In a machine vision inspection method that includes acquiring a first image and thresholding at least selected pixels in the image on a per pixel basis, the improvement comprising the steps of

digitally defocusing the image by generating, for each of at least selected neighborhoods of plural pixels in the first image ("first image pixels"), a value

("defocused value") that is an average of values of the plural pixels in that neighborhood, comparing that defocused value with one or more thresholds, and generating, based on that comparison, a result ("neighborhood threshold result") for that neighborhood,

generating for each of at least selected pixels in the first image an additional result that is a function of (i) a neighborhood threshold result for a neighborhood which includes that pixel, (ii) a result determined by thresholding that pixel on a per pixel basis.

24. In a machine vision method according to claim 23, the improvement wherein the one or more threshold are held constant for all neighborhoods of first image pixels.

25. In a machine vision method according to claim 23, the improvement wherein the one or more thresholds used with at least one neighborhood of first image pixels vary from value of the threshold used with at least one other neighborhood of first image pixels.

26. In a machine vision method according to 25, the further improvement wherein the one or more thresholds are a function of values of plural pixels in a region that includes a plurality of neighborhoods of first image pixels.

27. In a machine vision method according to claim 23, the further improvement comprising generating an image ("threshold image") comprising the neighborhood threshold results for a plurality of neighborhoods of the first image.

28. In a machine vision method according to claim 27, the further improvement comprising concurrently displaying the first image and threshold images in order to facilitate operator evaluation of an object imaged thereby.